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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/768,630

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Hideo Miyake

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11/28/2007

STAAS & HALSEY LLP

SUITE 700

1201 NEW YORK AVENUE, N.W.

WASHINGTON, DC 20005

EXAMINER

LI, AIMEE J

ART UNIT

PAPER NUMBER

2183

MAIL DATE

DELIVERY MODE

11/28/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	09/768,630	MIYAKE ET AL.	
	Examiner	Art Unit	
	Aimee J. Li	2183	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 05 September 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 18-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 18-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 January 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

1. Claims 1-5 and 18-20 have been considered. Claims 1-5 and 18-20 have been amended as per Applicants' request.

***Papers Submitted***

2. It is hereby acknowledged that the following papers have been received and placed of record in the file: Amendment as received 05 September 2007.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-5 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golliver et al., U.S. Patent Number 5,928,356 (herein referred to as Golliver) in view of Nation et al., U.S. Patent Number 6,233,599 (herein referred to as Nation). Examiner notes that Nation was previously cited in Notices of References Cited PTO-892 dated 21 September 2004.

5. Referring to claims 1, 3, 4, 5, 18, 19, and 20, taking claim 3 as exemplary, Golliver has taught a computer which performs parallel processing of a plurality of programs in a time-division fashion (Golliver Abstract "...the processor executes instructions from a particular task for a period or time..."; column 2, lines 58-60 "Reference is also made to 'threads'..."; column 5, lines 7-10 "The context switch can be initiated in response to any of a wide variety of conditions, such as the current time slice expiring..."; and column 8, lines 8-11 "...it should be

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noted that ‘context switching’ as used herein refers to the switching of tasks...as well as the switching of threads...”), comprising:

- a. A memory (Golliver column 3, lines 59 to column 4, line 3 “...swapping of register contents between the register **110** and **115** and memory...”);
- b. An instruction fetch unit configured to fetch instructions from said memory (Golliver column 8, lines 38-44 “The instruction fetch and decode logic **815** fetches instructions from memory...” and Figure 8, element 815);
- c. Hardware resources divided into a plurality of areas, the hardware resources being used in common by a plurality of programs (Golliver column 3, lines 1-8 “...Each of the floating point registers **115** can be used by tasks or processes...”; column 4, lines 4-32 “...By logically separating the floating point registers **115** into two separate groups...”; and Figure 1, elements 115, Group 116 and Group 117);
- d. An evacuation unit configured to evacuate information stored in the given area if the given area used by the first program and a second area of said plurality of areas are necessary for execution of a second program (Golliver column 6, line 36 to column 7, line 41 “...if the MDL bit is set, then the low group of floating point registers is saved...If the mdh bit is set, then the high group of floating point registers is saved...”; Figure 6; and Figure 7), said evacuation unit subsequently evacuating information stored in the second area when use of the second area becomes actually necessary for execution of the second program (Golliver column 6, line 36 to column 7, line 41 “...if the MDL bit is set, then the low group of floating point registers is saved...If the mdh bit is set, then the high group of

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floating point registers is saved...”; Figure 6; and Figure 7), said information being evacuated to a portion of said memory that corresponds to the first program (Golliver column 3, lines 59 to column 4, line 3 “...swapping of register contents between the register **110** and **115** and memory...”); and

- e. A restoration unit configured to restore to a first area of the plurality of areas, a first part of information necessary for execution of the second program (Golliver column 3, line 59 to column 4, line 3 “...Swapping of register contents refers to...the restoring of previously saved contents into the registers...”), to mark the first area as a usable area while marking areas other than the first area as unusable areas (Golliver column 4, line 59 to column 5, line 50 “...When an access to a floating point register is detected, step **405**, the register control logic checks whether the access is to the high group, step **410**, or to the low group, step **412**...”; and Figure 4), to restore, to the second area, a second part of the information necessary for execution of the second program (Golliver column 3, line 59 to column 4, line 3 “...Swapping of register contents refers to...the restoring of previously saved contents into the registers...”) if execution of the second program needs to use an area that is marked as an unusable area (Golliver column 4, line 59 to column 5, line 50 “...When an access to a floating point register is detected, step **405**, the register control logic checks whether the access is to the high group, step **410**, or to the low group, step **412**...”; and Figure 4), and to restore to the first area the information evacuated from the first and second areas when the second program comes to a halt or to an end and to restore to the

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second area the information evacuated from the second area (Golliver column 3, line 59 to column 4, line 3 "...Swapping of register contents refers to...the restoring of previously saved contents into the registers...").

6. Golliver has not explicitly taught

- a. To record identification data identifying a first program as relating to information stored in a given area of the plurality of areas if the given area is used for execution of the first program, and
- b. Restoring the first and second areas based upon the identification data.

7. However Golliver has taught in column 3, line 59 to column 4, line 3 ("...Swapping of register contents refers to the saving of the current contents of the registers to memory...and the restoring of previously saved contents into the registers...") that the data is saved and retrieved from memory, but not specifically that an identifier is recorded with the thread information to distinguish which program thread has used the memory area. Nation has taught

- a. To record identification data identifying a first program as relating to information stored in a given area of the plurality of areas if the given area is used for execution of the first program (Nation column 7, lines 11-24 "...The thread identifier field **37** permits each general purpose register **36** to be uniquely associated with a corresponding thread..." and Figure 3C), and
- b. Restoring the first and second areas based upon the identification data (Nation column 14, lines 28-53 "...the state of the selected thread is loaded into the activity specifier register 39. Because the processor registers GPRS **38** and/or FPRs **40** have been partitioned into a plurality of register subsets, thread resources

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for the selected thread are available within the processor register set...” – In regards to Nation, the active registers are determined by whether the thread identifier matches the active thread identifiers, so, when they match, those registers are restored to their active state.)

8. A person of ordinary skill in the art at the time the invention was made, and as taught by Nation, would have recognized that register partitioning speeds up the thread switching process (Nation column 14, lines 34-45 “Register partitioning speeds up the thread switching process...”). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the register partitioning of Nation in the device of Golliver to increase speed of the device.

9. Claims 1, 4, 5, 18, 19, and 20 have similar limitations to claim 3 and are rejected for similar reasons. The only difference between claims 1 and 18 and claim 3 is that claims 1 and 18 does not have some limitations found in claim 3 and are, therefore, broader in scope. The only difference between claims 4, 5, 19 and 20 is that claims 4, 5, 19, and 20 are method claims while claim 3 is a computer claim. Also, claims 4, 19, and 20 are similar to claims 1 and 18 in that they are broader in scope than claims 3 and 5.

10. Referring to claim 2, Golliver in view of Nation has taught the computer as claimed in claim 1, further comprising an interruption unit which brings about interruption processing if the given area is necessary for execution of the second program (Golliver column 5, lines 4-17 “...The context switch can be initiated...” and Figure 3), wherein said evacuation unit operates as part of the interruption processing to record the identification data and to evacuate the information stored in the given area (Golliver column 6, line 36 to column 7, line 41 “...if the

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MDL bit is set, then the low group of floating point registers is saved...If the mdh bit is set, then the high group of floating point registers is saved..."; Figure 6; and Figure 7).

***Response to Arguments***

11. Applicant's arguments with respect to claims 1-5 and 18-20 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

13. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

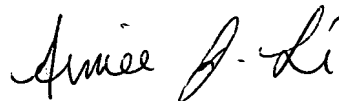
14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aimee J. Li whose telephone number is (571) 272-4169. The examiner can normally be reached on M-T 7:00am-4:30pm.



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15. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (571) 272-4162. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

16. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Aimee J Li  
Examiner  
Art Unit 2183

25 November 2007